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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,287	09/22/2003	Nobuaki Kubo	243055US2	5622

22850 7590 06/10/2005

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EXAMINER	
PHAM, HAI CHI	
ART UNIT	**PAPER NUMBER**
2861	

DATE MAILED: 06/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/665,287	KUBO, NOBUAKI	
	Examiner	Art Unit	
	Hai C. Pham	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14 and 17-49* is/are pending in the application.

4a) Of the above claim(s) *1-11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12,14,17,18,23,26,27 and 29-49* is/are rejected.

7)☒ Claim(s) *19-22,24,25 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 16, 19, 24 and 28 is withdrawn in view of the newly discovered reference to Ono (JP 2001-194613). Rejections based on the newly cited reference follow.

Information Disclosure Statement

2. The information disclosure statement (IDS) filed 12/09/04 provides a list of related applications submitted for consideration by the Office. They have been placed in the application file. The information referred to has been considered by the examiner.

Claim Objections

3. Claims 44 and 45 are objected to because of the following informalities:

Claim 44:

- Claim 44 should claim dependency from claim **42** (instead of claim 41) since claim 44 recites further limitation with respect to claimed element "elastic member", which is recited only in claim 42.

Claim 45:

- Line 1, "or" should read –and-- since the correction of the curve of the scanning line and that of the inclination of the scanning line are being claimed.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 12, 14, 18, 23, 26-27, 29-34, 39-40, 43 and 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toda (Pub. No. U.S. 2001/0017645).

Toda discloses an image forming apparatus including a light scanning device, which comprises an optical element (optical imaging system including f-Π lens 44 and cylindrical mirror 48) that images, on an image holding body (photoreceptor drum 18), a light beam emitted from a light source (LD 36), a holding member (holder 76) that holds the optical element, scanning line curve correcting means (scanning line bent adjusting unit) (Fig. 8B) for correcting the optical element in a sub scanning direction to correct a scanning line in the sub scanning direction, the scanning line being formed by the light beam, and scanning line inclination correcting means (scanning line inclination adjusting unit) (Fig. 8A) for entirely tilting the optical element to correct an inclination of the scanning line (the cylindrical mirror 48 being pressed at one end by the adjusting screw 90 such that the entire cylindrical mirror is tilted toward the sub-scanning directing), wherein at least one part of the scanning line curve correcting means, and at least one part of the scanning line inclination correcting means are provided integrally with the

holding member (the two scanning line inclination and bent adjusting units being an integral part of the assembly as shown in Fig. 6).

Toda fails to teach the holding member including a supporting member supporting the optical element from the sub-scanning direction to include a reference surface that contacts with the optical element to provide a reference position for the optical element, and the pressing means being disposed opposite to the reference surface.

Ono discloses an optical scanner comprising a scanning lens (11), a holding part (30) for supporting the scanning lens from the sub-scanning direction, the holding part having a reference surface (30a, Fig. 1c) that contacts the bottom surface of the scanning lens (bottom surface of the supporting part 11c of the scanning lens), and a pressing means (adjustable screw 33) being provided on the top surface of the scanning lens, opposite to the reference surface with respect to the scanning lens so as to correct a scanning line curve by turning the screw in the forward or backward direction.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to the holding member for supporting the scanning lens with a reference surface being defined at the contact surface between the holding member and the scanning lens in the device of Toda as taught by Ono. The motivation for doing so would have been to provide a stable reference position to the scanning so as the compensation for a curve in the scanning line can be made with the provided adjusting screw.

Toda further teaches:

- the holding member includes a reference surface that contacts with the optical element (as defined by the upper surface of the cylindrical mirror 48 facing the frame 70 of the holder 76), and that provides a position reference for the optical element in the holding member, and the holding member further includes a supporting member that is long in a main scanning direction (blocks 72 and 74 and cover 50), and that supports the optical element from the sub scanning direction,
- the reference surface is formed at a part that does, not correspond to both end parts of the optical element,
- a single number of the pressing means (single screw 92) located at the center of the optical element,
- pressing means (screw 92) for pressing the optical element from an opposite of the surface of the optical element that contacts with the supporting member,
- the pressing means includes a screw (92) that is moved relative to the optical element in a direction including the sub scanning direction,
- The scanning line inclination correcting means entirely tilts the holding member (76) together with the optical element (48) to correct the inclination of the scanning line (Fig. 6),
- The scanning line inclination correcting means includes a supporting point member (using steel ball 78) (Fig. 7) that provides a supporting point when the scanning line inclination correcting means tilts the holding member,

- independently of each other, the scanning line curve correcting means and the scanning line inclination correcting means correct the scanning line (via separate adjusting screws 92 and 90, respectively) (Fig. 6),
- the light scanning device is used for scanning a plurality of the image holding bodies (photoreceptor drums 18K, 18Y, 18M, 18C) by the light beams (LDs 36K, 36Y, 36M, 36C) (Figs. 1 and 2),
- the plurality of image holding bodies are provided for forming toner images of colors that are different from each other (colors KYMC),
- the scanning line curve correcting means and the scanning line inclination correcting means correct at least one beam of the beams corresponding to the plurality of image holding bodies, respectively (Fig. 1, 2),
- one of colors corresponding to the plurality of photoconductive bodies, respectively is set as a standard color (color black), and the scanning line curve correcting means and the scanning line inclination correcting means perform correcting to conform, to the scanning line of the standard color, the scanning lines corresponding to the colors other than the standard color (paragraphs [0134]),
- The standard color is black [or magenta],
- a fixed member (support member 86) that supports the holding member such that the holding member is movable in a direction of correcting the inclination of the scanning line, wherein the scanning line inclination correcting means comprises an elastic member (plate spring 88) that is provided integrally with the

holding member and the fixed member, and that supports the holding member such that the holding member is movable relative to the fixed member in the direction of correcting the inclination of the scanning line, and holding member tilting means (adjusting screw 90) for tilting the holding member against force generated from the elastic member,

- the holding member tilting means includes a screw (screw 90),
- the elastic member includes a leaf spring and/or a coil spring (plate spring 86).

The method claims 45-48 are deemed to be clearly anticipated by functions of the above structures.

6. Claims 41, 42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toda in view of Ono, as applied to claim 12 above, and further in view of Yokoyama (Pub. No. U.S. 2004/0041992).

Toda, as modified by Ono, further suggests using an actuator as a driving means for driving the holding member to be tilted so as to automatically or periodically correct the scanning line inclination (paragraph [0033]) but fails to disclose the inclination detection means for controlling the scanning line inclination.

Yokoyama discloses an image forming apparatus including a light scanning device, which comprises an optical element (imaging lenses 69, Fig. 7A) and that images, on an image holding body (drum 1), a light beam (L1) emitted from a light source, and a scanning line inclination correcting means (Figs. 7A-7C) for entirely tilting the optical element to correct an inclination of the scanning line, an inclination detection

means (position information measuring means –not shown-) for measuring an amount of position displacement from an ideal position (paragraph [0081]) such that an electrically controllable actuator can operated to adjust the scanning line inclination (paragraph [0088]).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the position information measuring means as taught by Yokoyama to operate along with the actuator in the device of Toda such that the Toda-suggested automatic scanning line inclination adjusting mechanism can be performed.

7. Claims 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toda in view of Ono, as applied to claims 12 and 30 above, and further in view of Azumai et al. (U.S. 6,320,682).

Toda, as modified by Ono, further discloses a position displacement detection means for detecting a writing start position displacement in the sub scanning direction that is relative amount between the plurality of image holding bodies, wherein feedback control of the writing start position adjusting means is performed based on the writing start position displacement detected by the position displacement detection means (paragraphs [0097]-[0101]), but fails to teach the rotating optical path refracting member, the optical path refracting member including a wedge-shaped prism.

Azumai et al. discloses an image forming apparatus including an optical path refracting member in the form of a wedge-shaped prism (315) including a rotating

mechanism for rotating the prism in finely adjusting the scanning positions of the laser beam in the sub-scanning direction (col. 6, lines 30-63) (Fig. 4).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a rotating optical path refracting member in the form of a wedge-shaped prism as taught by Azumai et al. in the device of Toda. The motivation for doing so would have been to correct the positional deviation of the laser beam in the sub-scanning direction with a simple configuration and without having to cope with the phase deviation of the polygon mirror as suggested by Azumai et al.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Toda in view of Ono, as applied to claim 12 above, and further in view of Kanehashi (JP 11-231240).

Toda, as modified by Ono, discloses all the basic limitations of the claimed invention except for the a plurality of the pressing means.

Kanehashi discloses an optical scanner including a mechanism for adjusting a scanning line bow having a plurality of adjusting screws (48) disposed along the longitudinal direction of the mirror (23) such that the curve of the scanning line of different shapes can be finely adjusted (Fig. 6).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a plurality of adjusting screws as taught by Kanehashi in the device of Toda. The motivation for doing so would have been to be capable of adjusting the scanning line bow of different shapes.

Allowable Subject Matter

9. Claims 19-22, 24-25 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicant's arguments with respect to claims 12, 14, 17-18, 23, 26-27 and 29-49 have been considered but are moot in view of the new grounds of rejection presented in this Office action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HAI PHAM
PRIMARY EXAMINER

June 7, 2005